



Artisan Technology Group is your source for quality new and certified-used/pre-owned equipment

- FAST SHIPPING AND DELIVERY
- TENS OF THOUSANDS OF IN-STOCK ITEMS
- EQUIPMENT DEMOS
- HUNDREDS OF MANUFACTURERS SUPPORTED
- LEASING/MONTHLY RENTALS
- ITAR CERTIFIED SECURE ASSET SOLUTIONS

SERVICE CENTER REPAIRS

Experienced engineers and technicians on staff at our full-service, in-house repair center

*InstraView*SM REMOTE INSPECTION

Remotely inspect equipment before purchasing with our interactive website at www.instraview.com ↗

WE BUY USED EQUIPMENT

Sell your excess, underutilized, and idle used equipment. We also offer credit for buy-backs and trade-ins. www.artisanng.com/WeBuyEquipment ↗

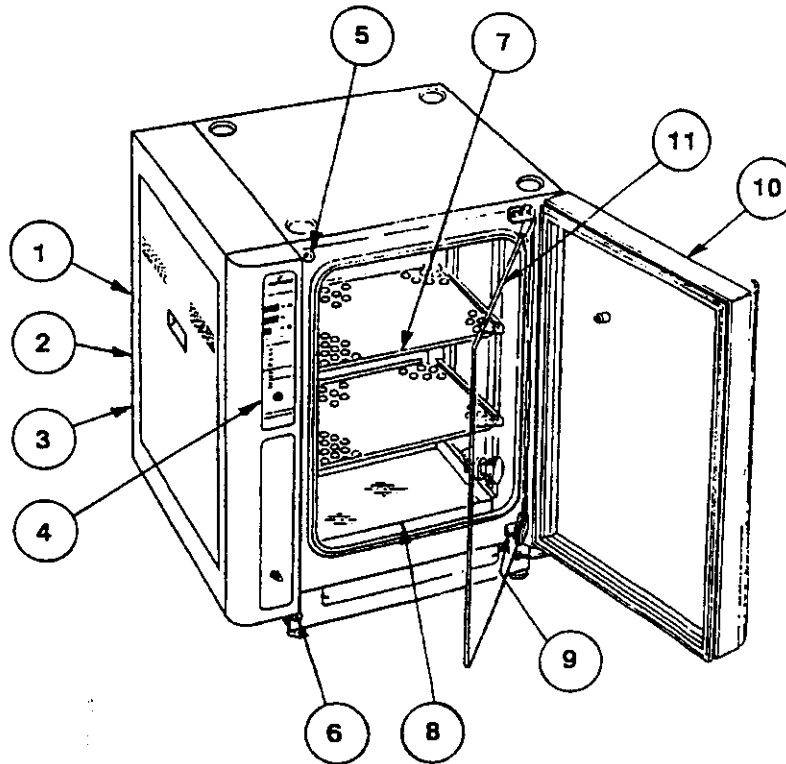
LOOKING FOR MORE INFORMATION?

Visit us on the web at www.artisanng.com ↗ for more information on price quotations, drivers, technical specifications, manuals, and documentation

Contact us: (888) 88-SOURCE | sales@artisanng.com | www.artisanng.com

1.0 Guide To Components

1. Air Inlet Filter
2. Circuit Breaker
3. On/Off Switch
4. Front Panel
5. Fill Port
6. Drain Valve
7. Shelf Assembly
8. Water Pan
9. Magnetic Door Switch
10. Outer Door
11. Inner Glass Door



OM0069

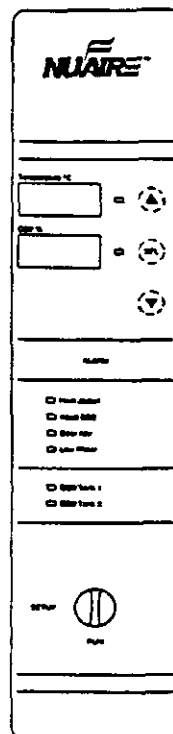
2.0 Control Panel and Indicators


- | | |
|--|---|
| ■ HEAT JACKET | Indicates Main Heater ON |
| ■ DOOR AJAR | Inner Glass Door Open |
| ■ LOW WATER | Add Water to Jacket |
| ■ INJECT CO ₂ | Indicates Injection of CO ₂ |
| ■ CO ₂ TANK 1 | Indicates CO ₂ Tank in Use |
| ■ CO ₂ Tank 2 (Option)
ALARM | Indicates CO ₂ Tank in Use
Fault Occurrence |

[SEL] Select key allows selection of parameters on display

↑ UP arrow key allows increase of parameter values

↓ DOWN arrow key allows decrease of parameter values



SETUP 
RUN

Mode Switch - Indicates Incubator
is Running or In Setup.

Temperature °C

RUN Mode Indicators
Indicates Present Chamber Temperature

CO₂ %

Indicates Present Chamber CO₂ Percent

Humidity %

(Option) Indicates Present Chamber Humidity Percent

RUN Mode Fault Indicators

Temperature °C

Blinking Green LED Next to Display Indicates Chamber
Temperature Fault.

CO₂ %

Blinking Green LED Next to Display Indicates CO₂ Percent
Fault.

Humidity %

Blinking Green LED Next to Display Indicates Humidity Percent
Fault.

All Displays Blinking Indicate Power Interruption.

3. Fill incubator water-jacket with SINGLE distilled or de-ionized water. No purer than 5 MEGOHM water should be used. Use enclosed tubing and fill port adapter to fill water-jacket until the low water light on the front panel turns off. Add an additional 1 to 2 liters of water and install fill port plug. **ABSOLUTELY NO CHLORINATED OR HALOGEN MATERIALS ARE TO BE USED IN THE WATER-JACKET.**
4. Attach CO₂ gas supply to the CO₂ inlet on the incubator backpanel. Use a TWO-STAGE REGULATOR and set the output pressure to approximately 20 PSI.
5. Attach air inlet tubing/filter to the air inlet fitting port on the incubator back panel.
6. Enter temperature and CO₂ percent setpoints (see section 4.0).
7. Once parameter setpoints are entered, turn mode switch to run and let incubator stabilize for 24 hours. The CO₂ percent will indicate "dely" until the incubator reaches within 2° of setpoint temperature.

4.0 Setpoint Parameter Entry

Setpoint values are entered by pressing the "SEL" key to the desired parameter indicator. The value of the selected parameter will be shown in the display in the form "XX.X". To enter a setpoint, perform the following:

Chamber Temperature

- Turn Mode Switch to Set Up
- Press [SEL] to Indicate Green LED Next to Chamber Temperature Display
- Press ↑ or ↓ to Indicate Desired Temperature
- Turn Mode Switch Back to Run

CO₂ Percent

- Turn Mode Switch to Set Up
- Press [SEL] to Indicate Green LED Next to CO₂ Percent Display
- Press ↑ or ↓ to Indicate Desired CO₂ Percent
- Turn Mode Switch Back to Run

Humidity RH (Optional)

- Turn Mode Switch to Set Up
- Press [SEL] to Indicate Green LED Next to Humidity Percent Display
- Press ↑ or ↓ to Indicate Desired Humidity Percent
- Turn Mode Switch Back to Run

NOTE: If an entry error is made, re-enter data.

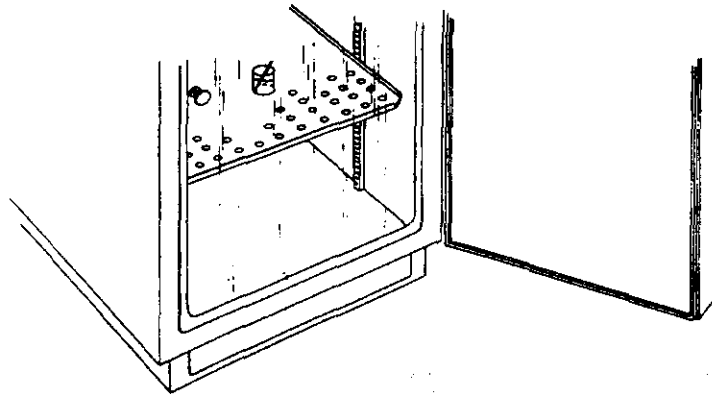
OM0069

8

} } } } } } } } } } } } } }

5.0 Chamber Temperature Calibration

The US Autoflow's TEMPERATURE CALIBRATION MUST BE PERFORMED WITHIN 1°C OF THE PLANNED OPERATING TEMPERATURE. Normally, 37.0°C is the most common setpoint. With the incubator operating at its setpoint, place a mercury glass thermometer in a glass beaker filled with water or through an inverted Styrofoam cup resting on a shelf in the middle of the chamber. Do not place the glass beaker on the bottom of the incubator chamber. Placing the thermometer in the middle of the chamber will give the most accurate results for calibration. Allow the thermometer 2 hours to stabilize.



When the temperature is stabilized at the operating temperature, perform the following calibration procedure.

- Turn Mode Switch to Run
- Press [SEL] to indicate green LED next to temperature display
- Press and hold one ↑ key for four seconds, display blinks
- Press ↑ or ↓ key to indicate same temperature as thermometer
- Press [SEL] key to complete calibration

The chamber temperature calibration is complete. Let unit stabilize for 8 to 12 hours. If the chamber temperature (actual thermometer) still does not match the display, perform the above procedure again. In some cases it might be necessary to calibrate several times to achieve a stable condition due to ambient conditions of temperature and humidity within the laboratory.



6.0 Door Temperature Calibration

The US Autoflow's inner glass door temperature calibration is best accomplished by running the incubator 24 hours with the water pan in place and perform the following calibration sequence if required.

Open the incubator door and look for general condensation. Some condensation on the glass door is desirable as an indication of adequate humidity in the chamber. Typically one to two inches of condensation in the corners of the glass door indicates a properly calibrated door heater. However, if calibration is required, simply perform the procedure as stated below. The door heater operates as a percentage ON/OFF (0 is off, 100 is full ON). Typically, 40 to 60 percent is the most effective setpoint range.

- Turn Mode Switch to Set Up.
- Press [SEL] to indicate green LED next to temperature display.
- Press both ↑ or ↓ keys simultaneously, display "dor"/door heat % on (XX).
- Press ↑ or ↓ key to desired door heat % on.
- Press [SEL] to complete the calibration.
- Turn Mode Switch back to Run.

7.0 CO₂ Control Calibration

CO₂ Control Calibration can be performed any time the CO₂ fyrite measurement doesn't correlate to the front panel display. However, this calibration **SHOULD NOT BE PERFORMED MORE THAN ONCE PER WEEK**. Sensor calibration should be performed if the CO₂ fyrite measurement doesn't match the display within ± 0.3 percent after one week. Before doing the following calibration, check and change, if necessary, the incubator in-line filter found within the control center.

When unit has stabilized at the operational temperature and CO₂ percentage, take a CO₂ fyrite measurement and, if necessary, perform the following:

- Turn mode switch to RUN.
- Press [SEL] to indicate green LED next to CO₂% display.
- Press and hold one \uparrow key for four seconds, CO₂ display blinks (clears all previous offsets) (compare the display CO₂ to the CO₂ fyrite measurement. If these two readings have a difference less than 2.0 percent, proceed to enter the fyrite value. If the difference is greater than 2.0%, proceed to CO₂ sensor calibration, Section 8.0)
- Press \uparrow or \downarrow key to indicate same CO₂% as fyrite measurement.
- Press [SEL] to set current value and exit calibration.



8.0 CO₂ Sensor Internal Calibration

CO₂ sensor front panel calibration should only be performed when required due to reoccurring error indicators. The CO₂ sensor has two calibration points, a zero point (ambient CO₂ percentage) and a span point (high CO₂ percentage). The following calibration procedure should be performed **ONLY** after the chamber temperature is stabilized and the CO₂ sensor has been operating at the *stabilized temperature for 2 hours*. *If the incubator has been in operation for a year or more, in line filter replacement may be necessary.* After the above conditions are satisfied, proceed with the following:

Step 1: Remove control center side panel.

Step 2: Remove sensor housing via (2) thumbscrews.

Step 3: Check and replace, if necessary, in-line filters.

Step 4: Replace sensor housing and secure it.

Step 5: Turn mode switch to setup

- Press [SEL] to indicate green LED next to CO₂% display.
- Press both **↑** and **↓** keys simultaneously, display blinks "dor".

Step 6: Open inner glass door and evacuate chamber for 1 minute. Close door and allow chamber environment to stabilize for 1 minute.

Step 7: Zero CO₂ Sensor

- Press **↑** key, display blinks "ZEr" and a positive or negative number.
- Locate the access panel on the sensor housing and open it.
- Open the front panel by opening outer door and quickly tap on left side of front panel.
- Locate the ZERO POT on the CO₂ sensor and adjust with blue trim pot tool provided until the CO₂ displayed window reads $0 \pm .005V$ (Allow 30 seconds between adjustments for sensor to stabilize).

Step 8: Span CO₂ Sensor

- Press **↑** key, display blinks "SPn" and the CO₂ percent.
Allow the unit to self inject CO₂ for 90 seconds. Wait an additional minute or until the display CO₂ percent reading is stable. The CO₂ inject green LED will indicate CO₂ flow into the chamber during the 90 second automatic CO₂ injection.

Step 9: Fyrite the incubator to determine correct CO₂ percentage.

Locate the SPAN POT on the CO₂ sensor control board (see Figure 2) and adjust with trim pot tool until the display CO₂ percent is the same as the fyrite CO₂ percentage (Allow 30 seconds between adjustments for sensor to stabilize.)

Step 10: Open inner glass door and evacuate chamber for 1 minute. Then, close the door.

- Press **↑** key to complete the calibration.
- Replace sensor access and control center side panel.
- Turn mode switch back to run.



Allow unit to run and stabilize for 2 hours. Check calibration with the fyrite. Compare the display CO₂ percent to your fyrite measurement. If these two readings have a difference greater than 0.5%, repeat above procedure beginning with Step 5. If these two readings have a difference of less than 0.5%, perform the CO₂ control calibration procedure in Section 7.0.

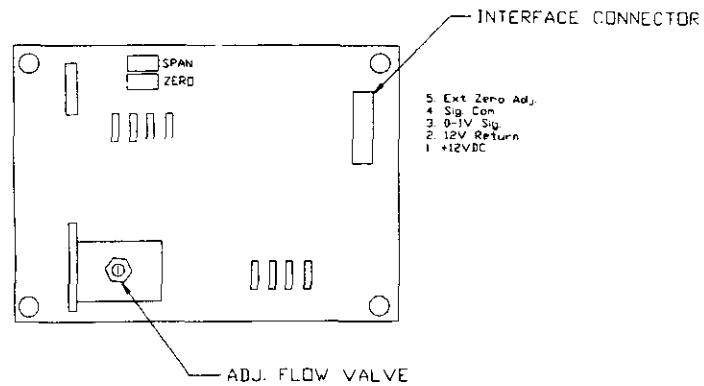


Figure 2

9.0 Relative Humidity Calibration (Option)

Relative humidity calibration can be performed anytime if the relative humidity option has been installed. The relative humidity sensor can be calibrated from a known source of humidity within the incubator chamber. Typically, the water pan is used because it has a known humidity level of 96 percent after one hour in the chamber. A calibration sensor may also be used if it's available.

The calibration procedure is a two step process. The first step is to perform an RH control calibration. The second step, RH sensor calibration, is only required if the RH control calibration cannot be performed.

When unit is stabilized at the operational temperature, CO₂ percentage and water pan in place, perform the following calibration procedure:

RH CONTROL CALIBRATION

- Turn Mode Switch to RUN.
- Press [SEL] to indicate green LED next to RH % display.
- Press and hold **↑** arrow key for four seconds, RH % display blinks (clears all previous offsets) (If the RH % display is between 93 to 99 percent, proceed to next step. If the RH % display is not between 93 to 99 percent, proceed to RH sensor calibration below).
- Press **↑** or **↓** arrow key to indicate 96 percent or known humidity percent.
- Press [SEL] to set current value and exit calibration.

OM0069

16

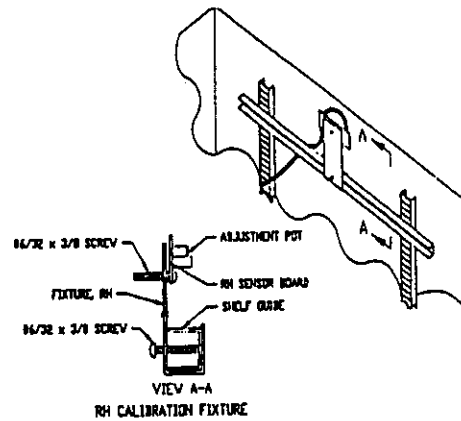
| | | | | | | | | | | | | | |

RH SENSOR CALIBRATION

Since the location of the humidity sensor board is difficult to reach. The calibration method described below, removes the humidity sensor board from the rear wall and mounts it to a calibration fixture next to the side access port of the chamber to allow the calibration to be preformed outside the chamber.

- Step 1: Remove RH sensor from upper wall of chamber.
- Step 2: Attach RH sensor cable extension and calibration fixture. Be sure the RH sensor adjustment pot is accessible through the side access port.
- Step 3: Close incubator doors, and, with the water pan in place, let incubator stabilize for a minimum of one hour.
- Step 4: When operational temperature and CO₂ percentage have stabilized with the water pan in place, perform the following calibration procedure:

- Turn mode switch to RUN
- Press [SEL] to indicate green LED next to RH% display. Press and hold ↑ arrow key for four seconds until display starts blinking (clears all previous offsets) adjust RH sensor pot through side access port. Adjust pot counter-clockwise to increase display or clockwise to decrease display. The goal is to achieve 96% or a known measurement.
- Press [SEL] to set current value and exit calibration.



Allow incubator to stabilize for 2 hours and repeat above steps if necessary. When calibration is complete, return RH sensor to original position.

10.0 Maintaining Your US Autoflow

US Autoflow Chamber

The chamber maintenance is up to the discretion of the owner and the extent of cleanliness and sterility desired. The shelves and bracket supports are all removable and autoclavable. The interior should be wiped down with an appropriate disinfectant such as 70% ISOPROPYL ALCOHOL or equivalent. **DO NOT USE ANY CHLORINATED OR HALOGEN MATERIALS IN THE CHAMBER.** The humidity pan should also be sterilized and the water changed regularly to assure sterility. A small amount of copper sulfate may be added to the humidity pan to inhibit bacterial growth.

US Autoflow Water-Jacket

The water-jacket requires no anti-bacterial agents. The US Autoflow already incorporates a copper tube producing copper sulfate which eliminates bacterial growth within the water-jacket. **DO NOT USE ANY CHLORINATED OR HALOGEN MATERIALS IN THE WATER-JACKET.**

CO₂ Supply Filter (50mm In-Line, Dry)

The CO₂ Supply Filter should be replaced every fifth empty CO₂ tank or when the filter is visibly discolored (yellow-brown). Note direction of flow (IN is labeled on one side of filter) when replacing filter.

Air Inlet Filter (50mm In-Line, Dry)

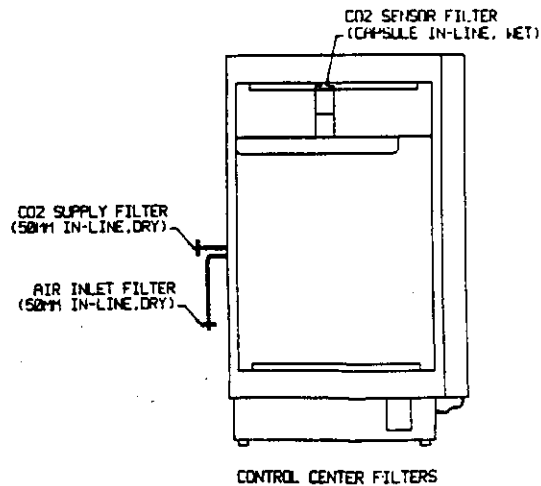
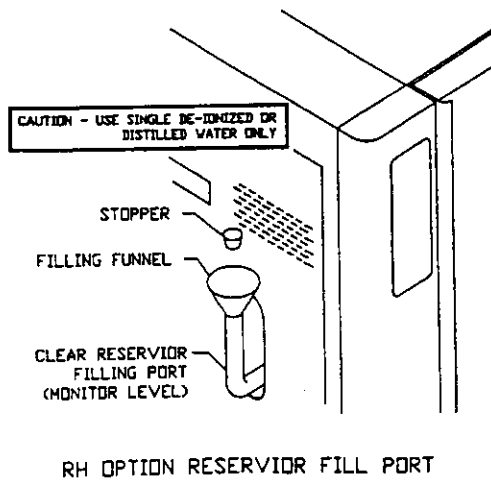
The Air Inlet Filter is located on the backpanel. The purpose of the filter is to cleanse the room air which is drawn into the chamber, via the pump, for three seconds every minute, assuring the proper amount of oxygen is available to the cultures. The air inlet filter should be replaced every six months.

CO₂ Sensor Filter (Capsule In-Line, Wet)

The CO₂ Sensor Filter should be replaced EVERY TWO YEARS to assure optimum performance. A visual check should be performed during the CO₂ sensor calibration to assure filter integrity. Remove sensor housing cover to perform visual check. A similar procedure should be followed with the RH filter as well (option).

RH Reservoir

THE RH RESERVOIR REQUIRES NO ANTI-BACTERIAL AGENTS. The RH Reservoir is filled using single distilled or de-ionized water. NO PURER THAN 5 MEG OHM WATER. Do not use any chlorinated or halogen materials in the RH Reservoir.



11.0 Error Indicators and Troubleshooting Guide

Step 1: NOTE ALL ERROR INDICATORS. When the incubator is running, any and all red or yellow LEDs indicate an error.

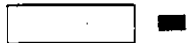
Step 2: CLEAR ERROR INDICATORS. Error indicators can be cleared by turning mode switch to setup and back to run.

Step 3: MONITOR RE-OCCURRENCE OF ERROR INDICATORS. If re-occurrence of the error indicator is immediate or daily, use guide below to correct the situation.

Error Indicator Troubleshooting Guide

CHAMBER TEMPERATURE

TEMPERATURE



ALARM

Indicates:

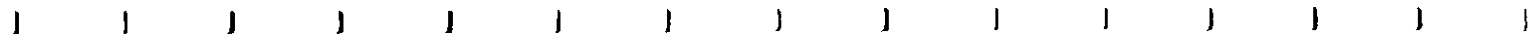
- Chamber temperature has exceeded allowable range or incubator not heating.
- Temp. sensor (chamber or jacket) are faulty or out of calibration.

Correction:

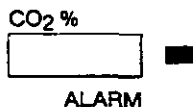
- Perform temperature sensor calibration.
- Check or replace fuse on main control board.
- Check or replace main control board.

OM0069

20



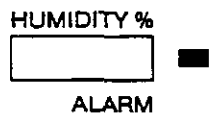
CO₂ PERCENT



- Indicates:
- Backup CO₂ control system is in effect. Turning the mode switch to setup and back to run will clear it and allow the CO₂ control system to resume as normal.
 - Reoccurring indicator is due to the CO₂ percentage value exceeding its allowable range.

- Correction:
- Check CO₂ gas supply to unit.
 - If display over setpoint, reduce gas cylinder regulator pressure.
 - If display under setpoint, increase gas cylinder regulator pressure.
 - Replace in-line filters.
 - Perform CO₂ sensor and control calibration using fyrite instrument.

RH PERCENT



- Indicates:
- RH value has exceeded allowable range. Usually due to a low water pan.

- Correction:
- Fill water pan.

GENERAL INDICATORS

■ DOOR AJAR

- Indicates:
- Inner glass door is not closed.
 - Magnetic switch needs a position adjustment.
- Correction: Close door or adjust switch position by loosening acorn nut.

■ LOW WATER

- Indicates:
- Low water level in water jacket.
 - Faulty level indicator switch.
- Correction:
- Fill jacket until light goes out.
 - Replace level indicator switch.

■ RH RESERVOIR (option)

- Indicates:
- Low water in RH reservoir
 - Faulty level indicator switch.
- Correction:
- Fill RH reservoir.
 - Replace level indicator switch.

LED DISPLAY INDICATORS

Sto
(with intermittent high/low
audible alarm)

- Indicates: Main control board failed to read correct setup information.

OM0069

22

| | | | | | | | | | | | | | | |

Correction: Turn incubator on and off. If error indicator is continuous, replace main control board. If error indicator appears once, recalibrate incubator temperature and CO₂ control.

delay

Indicates: CO₂ control is in delay for one of the following reasons:

- 1) Power interruption just occurred. Will resume CO₂ control within 30 minutes.
To bypass, perform following:
 - Turn mode switch to setup.
 - Press [SEL] to indicate green LED next to CO₂% display.
 - Press both ↑ or ↓ keys simultaneously, display flashes “dor”.
 - Press ↓ key four times quickly to exit bypass.
 - Turn mode switch back to run.
- 2) Chamber temperature is not within 2.0°C of setpoint. Cannot bypass.

**AUDIBLE ALARM W/NO
INDICATORS LIT**

Indicates: Tank switch occurrence.
Correction: Press [SEL] key to silence indicator.

BLINKING DISPLAYS

Indicates: Interruption of power.
Correction: Turn mode switch to setup and back to run.

For further assistance, call NuAire customer service at 1-800-328-3352 or (612) 553-1270 USA.



Artisan Technology Group is your source for quality new and certified-used/pre-owned equipment

- FAST SHIPPING AND DELIVERY
- TENS OF THOUSANDS OF IN-STOCK ITEMS
- EQUIPMENT DEMOS
- HUNDREDS OF MANUFACTURERS SUPPORTED
- LEASING/MONTHLY RENTALS
- ITAR CERTIFIED SECURE ASSET SOLUTIONS

SERVICE CENTER REPAIRS

Experienced engineers and technicians on staff at our full-service, in-house repair center

*InstraView*SM REMOTE INSPECTION

Remotely inspect equipment before purchasing with our interactive website at www.instraview.com ↗

WE BUY USED EQUIPMENT

Sell your excess, underutilized, and idle used equipment. We also offer credit for buy-backs and trade-ins. www.artisanng.com/WeBuyEquipment ↗

LOOKING FOR MORE INFORMATION?

Visit us on the web at www.artisanng.com ↗ for more information on price quotations, drivers, technical specifications, manuals, and documentation

Contact us: (888) 88-SOURCE | sales@artisanng.com | www.artisanng.com